

We claim:

1. A method for collecting data to identify an RF dead zone in a cell of a wireless network using a mobile station, the method including the steps:
  - a) receiving position data from the mobile station at a base station associated with the cell when the mobile station is powered up and located within the cell, wherein the position data includes multiple coordinates indicating a location of the mobile station within the cell;
  - b) communicating the position data from the base station to a mobile switching center associated with the base station and the wireless network; and
  - c) storing the position data in an RF dead zone network associated with the wireless network.
2. The method as set forth in claim 1 wherein the receiving step is performed whether or not the mobile station is connected to an incoming or outgoing call.
3. The method as set forth in claim 1 wherein steps a) through c) are periodically repeated while the mobile station is powered up and located within the cell.
4. The method as set forth in claim 1 wherein the multiple coordinates include an X coordinate and a Y coordinate associated with a surface area of the cell.
5. The method as set forth in claim 4 wherein the multiple coordinates include a Z coordinate associated with an altitude within the cell.
6. The method as set forth in claim 1 wherein the RF dead zone network includes an RF dead zone database, wherein the position data is stored in step c) is stored in the the RF dead zone database.
7. The method as set forth in claim 1 wherein the RF dead zone network further includes a data network, an RF dead zone data processor, and an output device.

8. The method as set forth in claim 1, before step a), further including:
  - d) at the powered-up mobile station, receiving information from at least three RF transmitting devices;
  - e) at the powered-up mobile station, determining the multiple coordinates forming the position data from the received information; and
  - f) at the powered-up mobile station, transmitting the position data to the base station.
9. The method as set forth in claim 8, before step d), further including:
  - g) at the powered-up mobile station, receiving a pilot strength measurement message from the base station; and
  - h) determining that the received pilot strength measurement message is less than a predetermined threshold.
10. The method as set forth in claim 1 wherein the RF transmitting devices include the base station and at least two additional base stations associated with the wireless network.
11. The method as set forth in claim 1 wherein the RF transmitting devices include satellites associated with a global positioning system satellite constellation.
12. A method for collecting data to identify an RF dead zone in a wireless network using a mobile station, wherein the wireless network provides wireless service to a geographic area comprised of a plurality of cells, wherein the wireless network includes a plurality of base stations corresponding to the plurality of cells, the method including the steps:
  - a) receiving position data from the mobile station with at least one base station of the plurality of base stations when the mobile station is powered up and located within the geographic area associated with the wireless network, wherein the position data includes multiple coordinates indicating a location of the mobile station within the wireless network;

b) communicating the position data from the at least one base station to a mobile switching center associated with the at least one base station and the wireless network; and

c) storing the position data in an RF dead zone database associated with the wireless network.

13. The method as set forth in claim 12 wherein the receiving step is performed whether or not the mobile station is connected to an incoming or outgoing call.

14. The method as set forth in claim 12 wherein steps a) through c) are periodically repeated while the mobile station is powered up and located within the geographic area associated with the wireless network.

15. The method as set forth in claim 1, before step a), further including:

d) at the powered-up mobile station, receiving information from at least three RF transmitting devices;

e) at the powered-up mobile station, determining the multiple coordinates forming the position data from the received information; and

f) at the powered-up mobile station, transmitting the position data to the at least one base station.

16. The method as set forth in claim 15, before step d), further including:

g) at the powered-up mobile station, receiving a pilot strength measurement message from the base station; and

h) at the powered-up mobile station, determining that the received pilot strength measurement message is less than a predetermined threshold.

17. The method as set forth in claim 15 wherein the multiple coordinates include an X coordinate and a Y coordinate associated with the geographic area of the wireless network.

18. The method as set forth in claim 17 wherein step d) includes receiving information from at least four RF transmitting devices and the multiple coordinates include a Z coordinate associated with an altitude associated with the geographic area of the wireless network.

19. A method for collecting data to identify an RF dead zone in a wireless network using a plurality of mobile stations, wherein the wireless network provides wireless service to a geographic area comprised of a plurality of cells, wherein the wireless network includes a plurality of base stations corresponding to the plurality of cells, the method including the steps:

at each powered-up mobile station:

- a) receiving a pilot strength measurement message from the base station; and
- b) determining that the received pilot strength measurement message is less than a predetermined threshold.
- c) receiving information from at least three RF transmitting devices;
- d) determining the multiple coordinates forming the position data from the received information; and
- e) transmitting the position data to the at least one base station;
- at one or more base stations:
- f) receiving position data from each powered-up mobile station whether or not any of the powered-up mobile station is connected to an incoming or outgoing call, the one or more base stations corresponding to one or more cells in which any of the powered-up mobile stations are located, wherein the position data from each powered-up mobile station includes multiple coordinates indicating a location of the powered-up mobile station within the wireless network; and
- g) communicating the position data to one or more mobile switching centers associated with the one or more base stations and the wireless network; and
- at one or more mobile switching centers:
- h) storing the position data received from the one or more base stations in an RF dead zone database associated with the wireless network.

20. The method as set forth in claim 19 wherein steps a) through h) are periodically repeated for each powered-up mobile station located within the geographic area associated with the wireless network.

21. The method as set forth in claim 20, further including:

- i) receiving a request for an RF dead zone output report from a wireless service provider associated with the wireless network;
- j) retrieving position data from the RF dead zone database in response to the report request;
- k) processing the retrieved position data according to the report request; and
- l) communicating the requested RF dead zone output report to the wireless service provider.

22. The method as set forth in claim 21, the method further including:

- m) using the RF dead zone output report to create an improved wireless network design with improved RF coverage in at least one dead zone area of the wireless network; and
- n) re-configuring the wireless network according to the improved wireless network design.